

## IN THE CLAIMS

1-7. (Cancelled)

8. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:  
providing a silicon substrate on which predetermined processes are completed;  
performing a plasma treatment to a surface of the silicon substrate in a gaseous atmosphere including nitrogen for about 30 seconds to about 60 seconds at a temperature ranging from about 400 °C to about 450 °C and a pressure ranging from about 3 Torr to about 5 Torr along with power ranging from about 400 W to about 500 W;  
depositing a titanium layer on the silicon substrate by employing a physical vapor deposition (PVD) technique; and  
causing the silicon substrate to react with the deposited titanium layer through the use of a thermal treatment to form an epitaxially grown titanium silicide layer having a phase of C49.

9. (Original) The method as recited in claim 8, wherein the plasma treatment is carried out by employing one of a nitrogen (N<sub>2</sub>) plasma treatment and an ammonium (NH<sub>3</sub>) plasma treatment.

10. (Cancelled)

11. (Original) The method as recited in claim 8, wherein the PVD technique is an ion metal plasma (IMP) technique.

12. (Original) The method as recited in claim 8, wherein the thermal treatment performed in the atmosphere of nitrogen results in formation of a titanium nitride layer on a surface of the titanium layer.

13. (Original) The method as recited in claim 8, wherein the thermal treatment is one of a rapid thermal process (RTP) and a furnace annealing.

14. (Original) The method as recited in claim 12, wherein the thermal treatment is one of a rapid thermal process (RTP) and a furnace annealing.

15. (Original) The method as recited in claim 8, wherein the thermal treatment includes the steps of:

performing a first RTP at a temperature ranging from about 670 °C to about 850 °C for about 20 seconds to about 30 seconds; and

performing a second RTP at a temperature ranging from about 850°C to about 900 °C for about 20 seconds to about 30 seconds.

16. (Original) The method as recited in claim 12, wherein the thermal treatment includes the steps of:

performing a first RTP at a temperature ranging from about 670 °C to about 850 °C for about 20 seconds to about 30 seconds; and

performing a second RTP at a temperature ranging from about 850°C to about 900 °C for about 20 seconds to about 30 seconds.

17. (Original) The method as recited claim 8, further comprising the step of cleaning the silicon substrate prior to performing the plasma treatment.

18. (Original) The method as recited in claim 17, wherein the cleaning proceeds by employing one of a wet cleaning process using buffered oxide etchant (BOE) or hydrofluoric acid (HF) and a dry cleaning process using nitrogen trifluoride (NF<sub>3</sub>).

19. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

forming a device isolation layer for defining a field region and an active region in a silicon substrate;

forming a transistor including source/drain diffusion regions in the active region of the silicon substrate;

performing a plasma treatment to the silicon substrate disposed above each source/drain region in a gaseous atmosphere including nitrogen for about 30 seconds to about 60 seconds at a temperature ranging from about 400 °C to about 450 °C and a pressure ranging from about 3 Torr to about 5 Torr along with power ranging from about 400 W to about 500 W;

depositing a titanium layer on the silicon substrate by employing a PVD technique;

causing the silicon substrate to react with the deposited titanium layer through the use of a thermal treatment to form an epitaxially grown titanium silicide layer having a phase of C49; and

removing the non-reacted titanium layer.

20. (Original) The method as recited in claim 19, wherein the plasma treatment proceeds by employing one of a N<sub>2</sub> plasma treatment and a NH<sub>3</sub> plasma treatment.

21. (Cancelled)

22. (Original) The method as recited in claim 19, wherein the thermal treatment includes the steps of:

performing a first RTP at a temperature ranging from about 670 °C to about 850 °C for about 20 seconds to about 30 seconds; and

performing a second RTP at a temperature ranging from about 850 °C to about 900 °C for about 20 seconds to about 30 seconds.

23. (Original) The method as recited in claim 19, further comprising the step of cleaning the silicon substrate in the source/drain diffusion regions prior to performing the plasma treatment by employing one of a wet cleaning process using BOE or HF and a dry cleaning process using NF<sub>3</sub>.

24-36. (Cancelled)